

REMARKS

Claims 26-32 are pending in this application. By this Amendment, a substitute Abstract is provided, the specification is amended, claims 1-10 and 17-25 are canceled, and claims 26-32 are added. Reconsideration and withdrawal of the rejections in view of the foregoing amendments and the following remarks are respectfully requested.

I. Formalities

The Office Action objects to the disclosure for informalities in the specification. The informalities have been corrected by amending the specification, and replacing the original Abstract with the attached substitute Abstract. Applicant respectfully requests that the specification amendments and substitute Abstract be entered and that the objection be withdrawn.

The Office Action objects to claims 3 and 5 for informalities. By this Amendment, claims 3 and 5 are canceled. Thus, the objections thereto are moot and should be withdrawn.

II. Claim Rejection- 35 U.S.C. § 112

The Office Action rejects claim 4 under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make

and/or use the invention. Because claim 4 has been canceled, the rejection is moot and should be withdrawn.

The Office Action rejects claim 20 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particular point out and distinctly claim the subject matter which Applicant regards as the invention. Because claim 20 has been canceled, the rejection is moot and should be withdrawn. However, the same term now appears in new claim 30. Applicant will address this rejection as if it had been applied to claim 30.

Claim 30, which depends from claim 26, recites that the combination of blades of the pipeline pig have a watermelon shaped profile. Applicant notes that the term "watermelon" describes a shape which is well known to those of ordinary skill in the art of pipeline pigs.

In particular, the Applicant refers to U.S. Patent No. 5,657,820 to Bailey et al (hereinafter "Bailey"), disclosed in an Information Disclosure Statement filed herewith, which is directed to a cutting system for use in pipe casing in the oil and gas industry. In Bailey, "watermelon mill" is referenced in the Abstract and throughout the disclosure, and refers specifically to a mill which has tapered ends and a somewhat fatter middle section. Bailey notes that the term "watermelon mill" is derived from the general shape of the tool: "watermelon mill 30 (so-called for its shape)...." See Bailey col. 5, lns. 4-5. The watermelon mill of Bailey is passed down tubing or piping as would the pig of the instant application. As such, Bailey demonstrates that the term "watermelon" is well known in the oil and gas industry to describe a general profile for tools for use in tubing and piping.

Applicant further refers to Product Family No. H15109 titled “String and Watermelon Mills” of the Baker Oil Tools Co., as shown on the first page of Attachment A, which is various pages copied from a Baker Oil Tools Co. catalog. Specifically, a Watermelon Mill is illustrated by a figure of a mill with tapered ends and a somewhat fatter middle section. This watermelon mill is used in pipe casing to remove tight spots, restrictions or doglegs, and cuttings. As such, Attachment A also demonstrates that the term “watermelon” is well known in the oil and gas industry to describe a general profile for tools for use in tubing and piping.

Accordingly, one of ordinary skill in the art would understand the terminology “the combination of blades have a watermelon shaped profile,” as set forth in claim 30, to mean the general profile of the blades is similar to the general profile of the watermelon mill of Bailey or Attachment A. Thus, claim 30 and claim 31, which depends from claim 30, particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

The Office Action rejects claims 21-25 for improper dependency. Because claims 21-25 have been canceled, the rejection is moot and should be withdrawn.

III. Claim Rejection- 35 U.S.C. § 102

The Office Action rejects claims 1-3, 5-7, 9-10, and 17 under 35 U.S.C. § 102(b) over U.S. Patent No. 3,939,519 to Muirhead (hereinafter “Muirhead”). Because claims 1-3, 5-7, 9-10, and 17 have been canceled, the rejection is moot and should be withdrawn.

IV. Claim Rejection- 35 U.S.C. § 103

The Office Action rejects claim 8 under 35 U.S.C. § 103(a) over Muirhead in view of U.S. Patent No. 4,603,449 to Knapp (hereinafter "Knapp"). The Office Action also rejects claim 18 under 35 U.S.C. § 103(a) over Muirhead. Finally, the Office Action rejects claim 19 under 35 U.S.C. § 103(a) over Muirhead in view of U.S. Patent No. 3,480,984 to Kidd (hereinafter "Kidd"). Because claims 8, 18, and 19 have been canceled, the rejections are moot and should be withdrawn.

V. New Claims

By this Amendment, claims 26-32 are added to this application. Claims 26-32 have been drafted in view of the applied references, and it is respectfully submitted that claims 26-32 are in allowable condition.

New independent claim 26 sets forth, in part, a pig for use with a tubular bore including one or more blades mounted on the body and configured to perform a rotational cleaning action on an internal surface of the tubular bore, wherein each blade is manufactured from a composite including a para-aramid fiber produced from poly-paraphenylene terephthalamide.

Applicant respectfully submits that Muirhead is directed to a condenser tube cleaning plug. Referring to Figures 1 and 2, a cleaning plug 11 is shown with scraper discs d_1 - d_5 attached to a central core body 12. The central core body 12 has a hollow passage 13 therethrough and a projection 15 with an exit orifice 17 forming a tapered nozzle 16.

Figure 4 shows a cross-section of an embodiment of the cleaning plug 11b which includes discs d_1 - d_7 . Each disc has four slits s_1 - s_4 spaced 90 degrees apart and each pair of adjacent slits form annular segments 18 in the discs d_1 - d_7 . Muirhead notes that "the core body 12 and the discs d_1 - d_7 of all embodiments are integrally formed of a resilient plastic material, such as polyethylene."

Applicant notes that Muirhead requires that the discs be flexible, indicating that: "[t]he disk segments 18 are physically flexible so as to readily deflect when the plug is placed in a confining tube to be cleaned, and to improve that flexibility, the slits s_1 - s_4 are provided." See Muirhead col. 6, lns. 6-10. Such flexibility must be incorporated into the discs of Muirhead because Muirhead is directed to cleaning a tube by wiping away the buildup of slime, mud and algae without harmful wearing of the interior wall of the tube. Muirhead also requires flexible discs in order for the tips of the annular segments to snap past and overlap one other when the inside diameter of the tube is reduced. Thus, Muirhead requires flexible discs in order to allow a wide range of tube sizes to be cleaned with a single size cleaning plug. See, for example, Muirhead col. 7, lns. 28-45.

In contrast to the flexible discs of Muirhead, an embodiment of the instant invention includes a pipeline pig with blades having sufficient strength to provide an adequate scraping action for removing stubborn scale and other deposits which flexible plastic blades would be unable to remove. In the past, such difficult to remove scale and other deposits were removed with devices using all metal blades. Metal blades were used to provide sufficient rigidity to

remove scale and other stubborn deposits. However, because of its inflexibility, it was not possible to use metal blades on different size tubular bores. Instead, it was necessary to have many different sized metal pigs, one for each size tubular bore.

In contrast, claim 26 recites a pig having one or more blades comprising a composite including para-aramid fiber produced from poly-paraphenylene terephthalamide (KEVLAR). Such blades are sufficiently rigid to remove scale and other stubborn deposits. However, the blades also flex slightly to accommodate different sized tubular bores. This slight degree of flexibility also allows the pig of the present invention to pass through coiled tubing where the diameter of the pig is slightly greater than the diameter of the tubing to more effectively scrape scale and particles from its walls, while centralizing the tubing.

It is respectfully submitted that Muirhead neither discloses nor suggests a pig as recited in claim 26, which includes relatively rigid blades formed of a KEVLAR composite. As noted above, Muirhead teaches that blades should be very flexible so that the blades can significantly compress and overlap one another. This is acceptable for the applications Muirhead contemplates, which only involve removing slime, mud and algae. The Muirhead device lacks the rigidity necessary to remove scale and other hard deposits.

Because the Muirhead reference does not disclose or suggest a pig as recited in claim 26, and does not suggest making any type of pig with rigid blades, as recited in claim 26, it is respectfully submitted that claim 26 is allowable. Dependent claims 27-32 are allowable for at least the same reasons, as well as for the additional features they recite.

Applicant respectfully submits that U.S. Patent No. 4,603,449 to Knapp (hereinafter "Knapp") is directed to a unitized pig body for paraffin removal. Referring to Figure 1, a unitized pig 10 having a central column 12 with a leading edge disk 14 and sealing scraper discs 18 is shown. Because Knapp is designed to remove soft deposits like paraffin, the pig is made from an elastomer, such as polyurethane. Additionally, the unitized pig body of Knapp is resilient and can flex and bend to accommodate undersized or non-round pipe. As such, Knapp neither discloses nor suggests a pig having relatively rigid blades including a para-aramid fiber, as recited in claim 26. Thus, claims 26-32 are allowable over Muirhead and Knapp, either alone or in combination, for all the same reasons discussed above in connection with Muirhead.

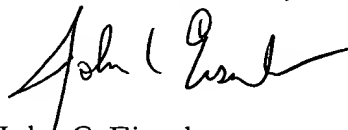
Applicant respectfully submits that U.S. Patent No. 3,480,984 to Kidd (hereinafter "Kidd") is directed to a pig apparatus. Referring to Figures 1 and 2, an assembly of pig bodies 10 having pig bodies 11, 12, 13 and 14 separated by spacing members 22, 23 and 24, respectively, is shown in a pipeline 15. Kidd indicates that the pig bodies 11, 12, 13 and 14 are made of elastomeric material, such as natural and synthetic rubbers, plastics and the like. Kidd also notes that a fairly high degree of resiliency is desirable for the pig bodies 11, 12, 13 and 14. As such, Kidd also neither discloses nor suggests a pig having relatively rigid blades including a para-aramid fiber, as recited in claim 26. Thus claims 26-32 are allowable over Muirhead and Kidd, either alone or in combination for all the reasons discussed above in connection with Muirhead.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **Randall H. Cherry**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
FLESHNER & KIM, LLP



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Enclosures:

Substitute Abstract
Information Disclosure Statement
Attachment A

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Date: January 14, 2003

TAPER MILL**Product Family No. H15110****DESCRIPTION/APPLICATION**

Taper Mills are designed to enter restricted areas in casing, tubing, or open hole and remove restrictions or obstructions by milling.

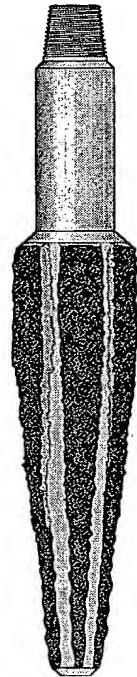
Taper Mill designs vary based on the intended use. Taper Mills designed for uses inside casing are dressed with SUPERLOY from the reduced OD at the bottom of the mill to the full drift of the casing. Once full drift OD is reached, the Taper Mill will have a length of smooth, turned down SUPERLOY for stabilization, minimizing any unnecessary casing

damage. For openhole applications the rough SUPERLOY Cutting Structure would extend over the entire dressed area of the mill.

When run with a section mill or pilot mill, the Taper Mill acts as a stabilizer reducing vibration and increasing section mill life. The Taper Mill also acts as a guide when entering the casing.

FEATURES/BENEFITS

- Mills restrictions from the casing ID
- Normally dressed with SUPERLOY
- Can be used to open a damaged window
- Can be dressed rough or smooth OD



Taper Mill
Product Family No. H15110

STRING AND WATERMELON MILLS**Product Family No. H15109****DESCRIPTION/APPLICATION**

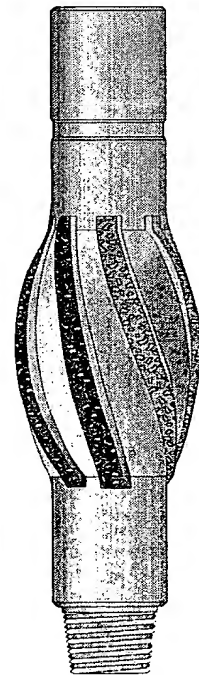
The String and Watermelon Mills are designed with many functions in mind. One function of the mill is to elongate casing windows during a whipstock operation. They can also be used to remove tight spots, restrictions, or dog legs in casing. These types of mills are often run above section mills so any bird nesting of cuttings can be broken up and circulated to ensure that the section mill can be pulled out of the well. Most of the mills have a standard drillpipe or drill collar connection to eliminate crossovers.

FEATURES/BENEFITS

- Mills restrictions from the casing ID
- Normally dressed with SUPERLOY
- May be inserted into workstring at any point
- Can be dressed rough or smooth OD



String Mill

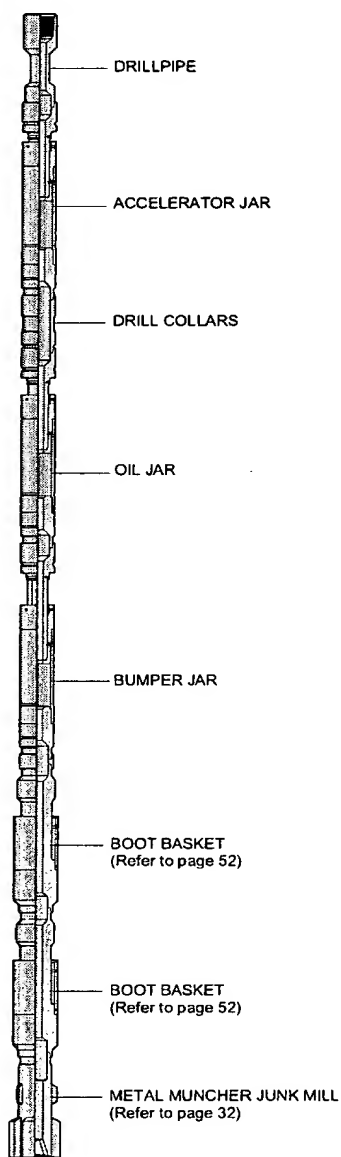


Watermelon Mill

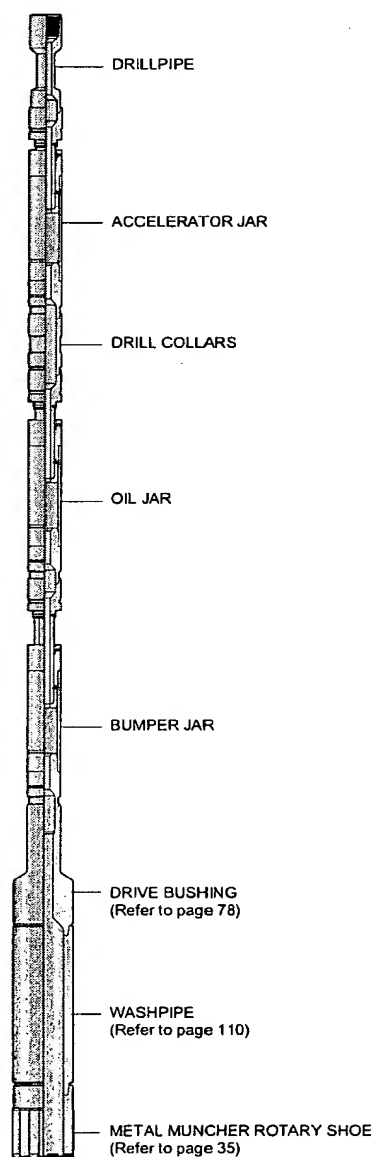
Product Family No. H15109

MILLS AND SHOES

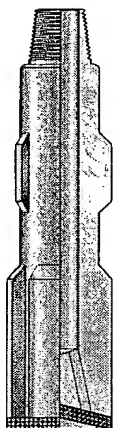
Mills and Shoes provide a means to remove metal, cement, or other debris that has become lodged in the well-bore. Mills come in a wide variety of types and are generally used when the full ID of the tubular needs to be cleaned. Applications include milling tight spots, cement, tubing, packers, bridge plugs, and other debris. Boot baskets are run above the mills to collect the larger pieces of debris. Rotary shoes are generally run with wash-pipe in applications where only the material between the tubular being washed over and the ID of the casing or formation need to be removed. Applications include but are not limited to sanded up tubing and open hole where the formation has fallen in. Washover shoes are also used to mill over packers. This allows for minimum material removal in order to free the packer. With both mills and shoes it is recommended to run jars and drill collars to help prevent sticking.



Junk Mill Bottomhole Assembly



Rotary Shoe Bottomhole Assembly



METAL MUNCHER Junk Mill
Product Family No. H15102

METAL MUNCHER JUNK MILL

Product Family No. H15102

DESCRIPTION/APPLICATION

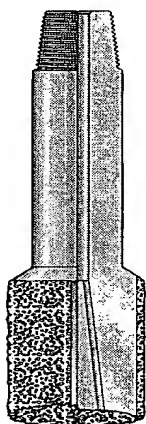
The METAL MUNCHER Junk Mill is designed for milling stationary obstructions. The junk mill utilizes the patented METAL MUNCHER technology as the lead cutting structure while being backed up by SUPERLOY tungsten carbide. With the SUPERLOY backing, if the METAL MUNCHER inserts become damaged the mill will perform like a stan-

dard junk mill until a new row of inserts are exposed.

The mills have been used to mill cemented tubing, in some cases, at rates exceeding 30 ft per hour. Cemented drill collars and drillpipes have in many cases been milled faster than they could be washed over and recovered.

FEATURES/BENEFITS

- Increased penetration rates
- Increased mill life
- Smaller, more uniform cuttings
- SUPERLOY backing



Cone Buster Mill
Product Family No. H15106

CONE BUSTER MILL

Product Family No. H15106

DESCRIPTION/APPLICATION

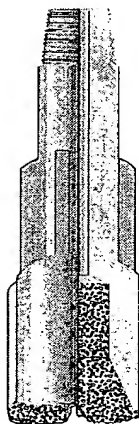
The concave Cone Buster Mill is dressed with SUPERLOY on the OD and has a slight concave bottom.

The mill is used for milling bit cones or other objects where it is advanta-

geous to keep the fish centered under the mill for greater effectiveness.

FEATURES/BENEFITS

- Ideal for milling bit cones in open hole
- Can be spudded on
- Dressed with SUPERLOY



Piranha Mill
Product Family No. H15111

PIRANHA MILL

Product Family No. H15111

DESCRIPTION/APPLICATION

The Piranha Mill is a SUPERLOY dressed mill with an offset center to prevent coring.

The Piranha Mill is used for milling cemented pipe and in situations where there are large amounts of junk in the hole that requires a mill with a longer life. This mill is specially designed with a deep "V" for maximum circulation of fluid and to hold a large amount of tungsten carbide dressing.

FEATURES/BENEFITS

- Ideal for milling tubing
- Increased mill life
- Offset center prevents coring
- Can be dressed for open or cased hole

BAKER OIL TOOLS ROTARY SHOES

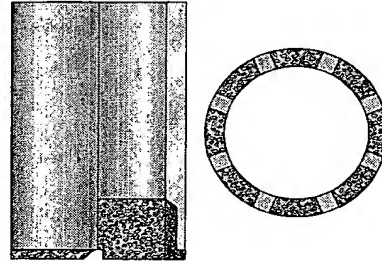
Product Family Nos. H15008, H15010, H15013, and H15014

Baker Oil Tools Rotary Shoes are made from heat-treated alloy steel and dressed with SUPERLOY, METAL MUNCHER or Opti-Cut. They are used on the bottom of washpipe in washover or milling operations. The specific application will dictate the type shoe best suited for the job.

Note: Consult your Baker Oil Tools Representative for specific recommendations.

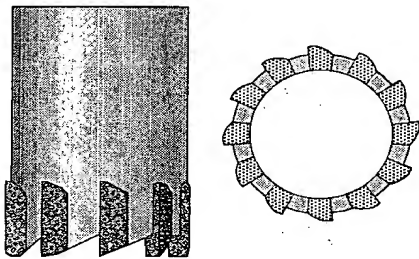
IMPORTANT ORDERING INFORMATION

To order, always specify shoe type: A through K; connection size; thread and weight; OD and ID of body; and OD and ID of cutting structure.



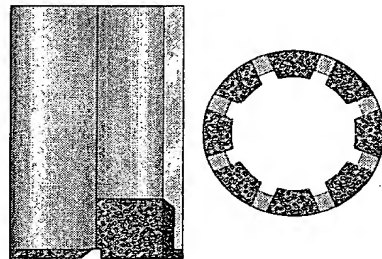
Type C Rotary Shoe (Flat Bottom; CH)

The Type C Rotary Shoe is used to cut metal on the fish where clearances are small. This shoe cuts on the inside and bottom only.



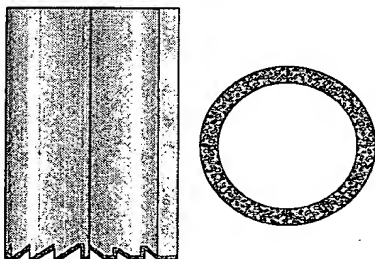
Type A Rotary Shoe (Tooth Type; OH)

The Type A Rotary Shoe is used for washing over and cutting formation. The mill tooth design with side wings allows maximum circulation. This shoe cuts on the outside and bottom only.



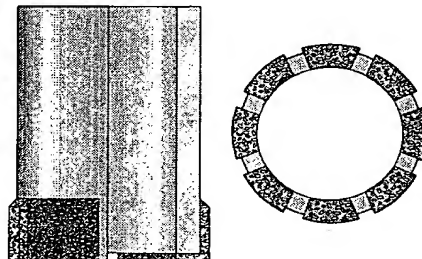
Type D Rotary Shoe (Flat Bottom; CH)

Similar to the Type C Shoe, the Type D Rotary Shoe has an internal upset for use where clearance permits. This shoe cuts on the inside and bottom only.



Type B Rotary Shoe (Tooth Type; CH)

The Type B Rotary Shoe is used for washing over. Mill tooth design permits maximum circulation consistent with limited clearances. This shoe cuts on the bottom only.



Type E Rotary Shoe (Flat Bottom; OH)

The Type E Rotary Shoe is used for washing over a fish in the open hole. It cuts on the outside and the bottom only.

Note: OH = Open Hole Applications
CH = Cased Hole Applications